Fire Products

NASA ARSET

Updated February 2014

ARSET

Applied Remote SEnsing Training

A project of NASA Applied Sciences

Fire Products Summary

*** NOAA Hazard Mapping System**
Operational Daily Fire and Smoke Analysis *North America*
Geostationary and Polar Orbiting Data
Real time satellite imagery loops

Archive image and KML files for the past 6 months
http://www.ospo.noaa.gov/Products/land/hms.html

Forest Service Active Fire Mapping Program
Interactive Fire Detection Mapping for the past 24 hours.
U.S. and Canada

Historical KML files of fire detection and fire radiative power available beginning July 2008

Monthly burn scar data in KML format.
http://activefiremaps.fs.fed.us/

Abba Fire Products
GOES fire imagery for *North and South America*
Geostationary loops for past 24 hours
http://cimss.ssec.wisc.edu/goes/burn/abba.html

NOAA Storm Prediction Center
Fire Weather Outlooks & Forecasts for 1 to 8 days for *U.S.*
http://www.spc.noaa.gov/products/fire_wx/

FIRMS – Fire Information for Resource Management System

Global MODIS interactive fire maps
for any period during the MODIS mission

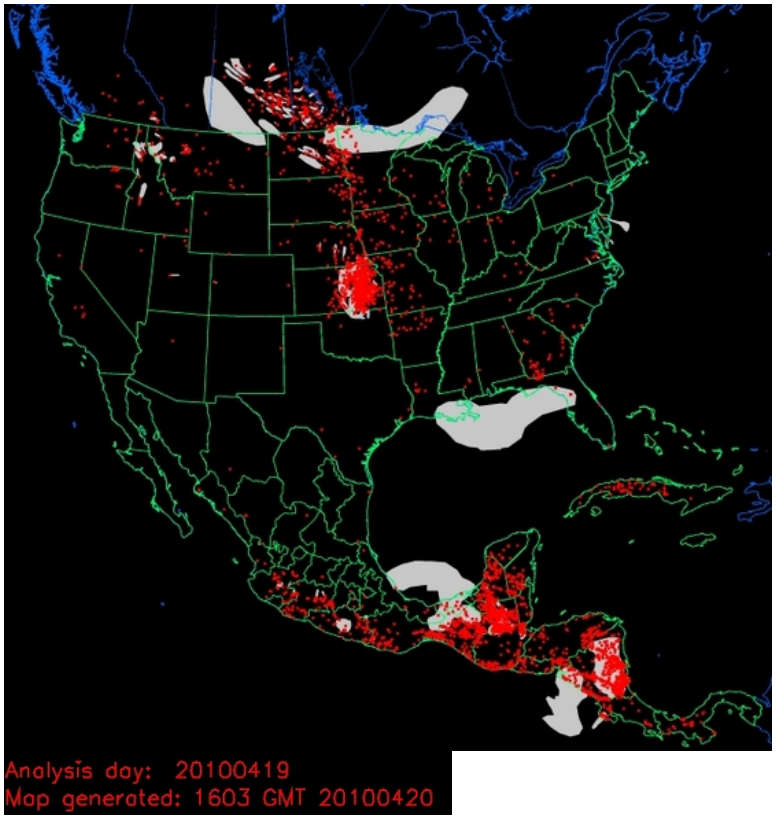
Burned area interactive map.
KML files for past 6 days

* *Email alerts for active fires.*
http://earthdata.nasa.gov/data/nrt-data/firms

NOAA Hazard Mapping System (HMS)

http://www.ssd.noaa.gov/PS/FIRE/hms.html

Operational daily fire and smoke analysis for North America



Product Integrates

- Satellite Data
- Automated Fire Detection Algorithms
- Ancillary Data Layers

Automated Fire Detection and Human Input

- *Analysts review fire detections and retain or delete them*
- *Analysts can add hotspots that the algorithms have not detected.*

NOAA Hazard Mapping System Fire and Smoke Product

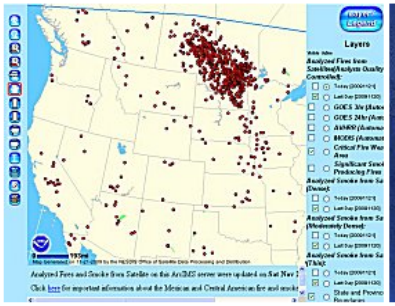
Fire Information from MODIS and GOES, Complied by NOAA

http://www.ospo.noaa.gov/Products/land/hms.html

Hazard Mapping System Fire and Smoke Product

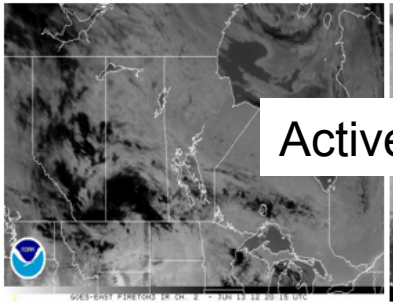
Current HMS Analysis

Analysis for day 6/13/2012 last updated at 6/13/2012 19:54:49 GMT



Click to view: Current HMS Fire and Smoke Analysis | Interactive GIS HMS Product | Google KML files: Fire | Smoke

Real-Time Satellite Imagery Loops



Active Fire Floater Imagery

GOES West

GOES East

NASA MODIS Rapid Response

Active products are only for the past 24 – 48 hours

NESDIS Products

Archived Fire Products (6 months)

Smoke Text Product | Archive

GOES Aerosol Smoke Products (GASP) East | West

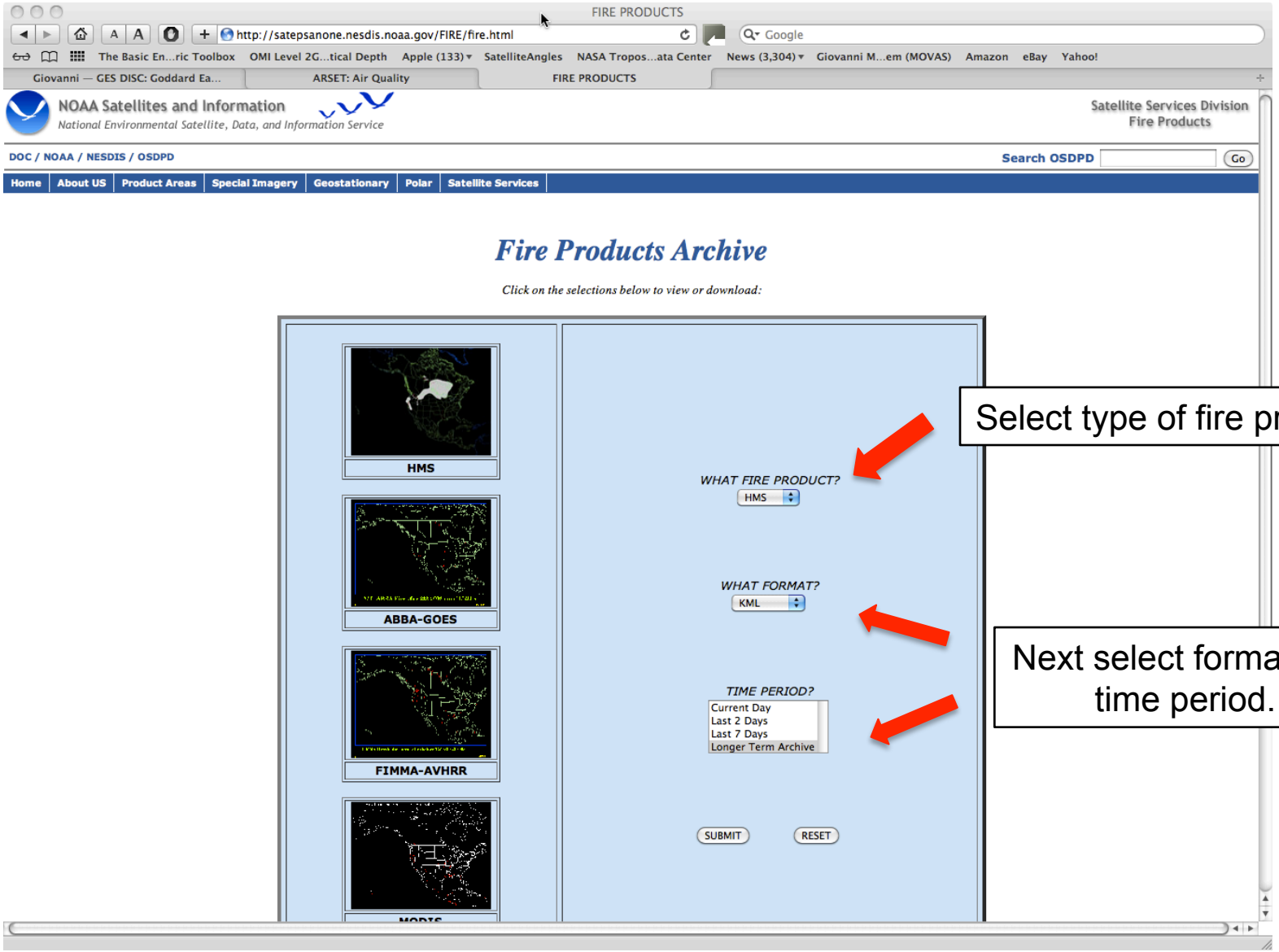
Automated Smoke Detection and Tracking Algorithm (ASDTA) GOES-East | GOES-West

Link to archived products

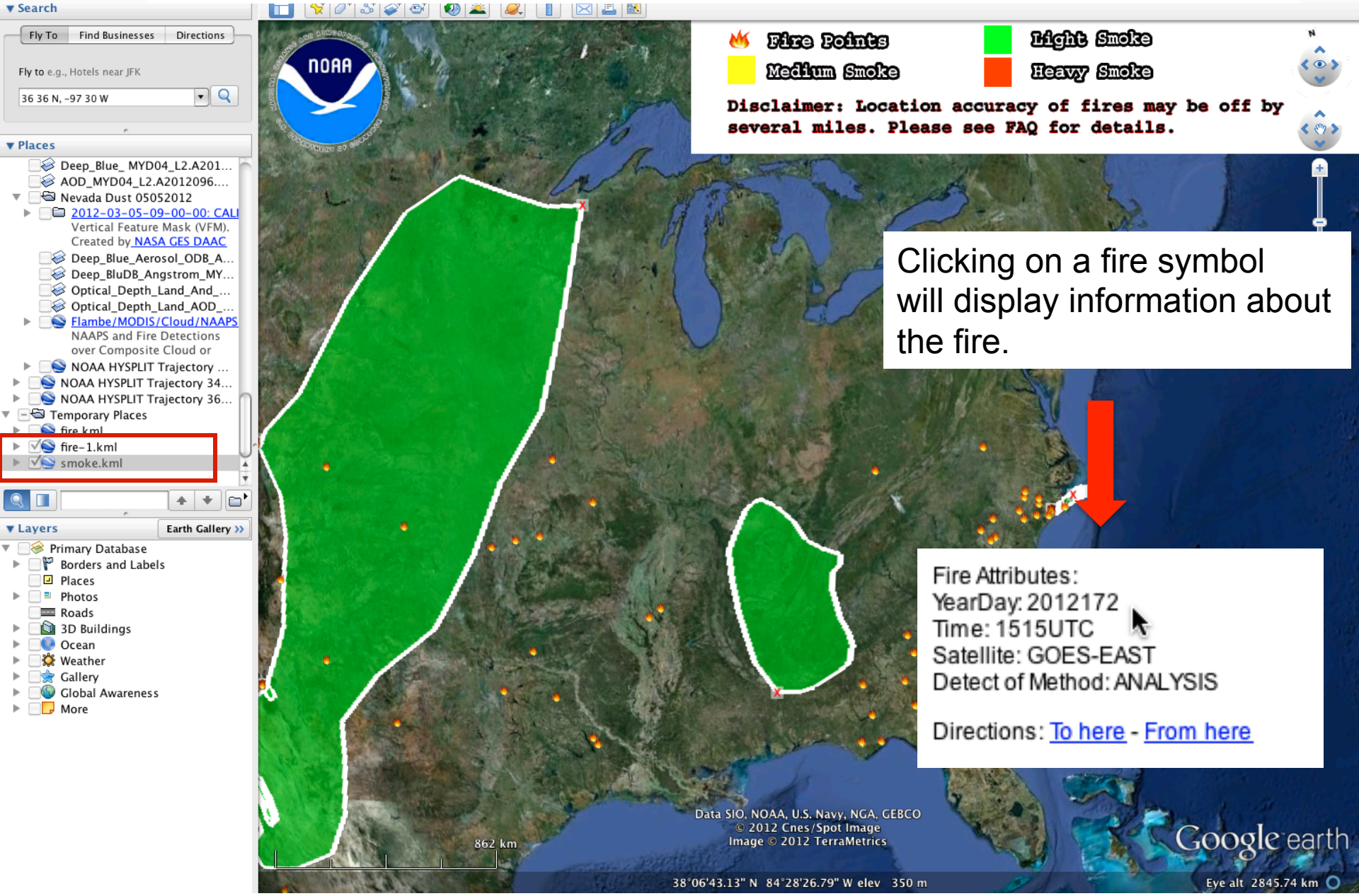
NOAA Hazard Mapping System Fire and Smoke Product

Fire Information from MODIS and GOES, Complied by NOAA

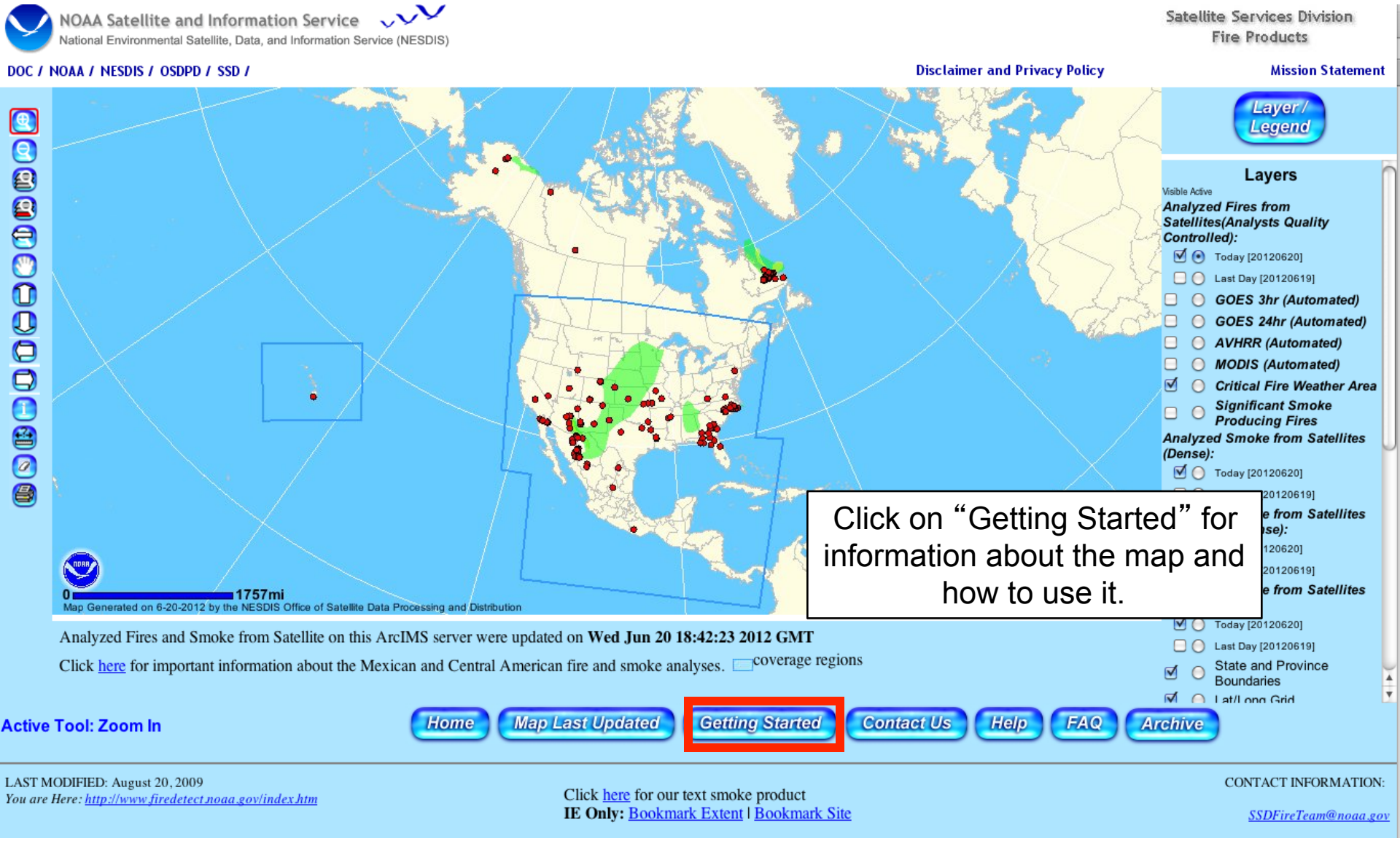
http://www.ssd.noaa.gov/PS/FIRE/hms.html



Fire and Smoke KML Files from NOAA HMS as Displayed in Google Earth



Interactive GIS HMS Map from NOAA



NOAA Hazard Mapping System (HMS)

Satellite input information for HMS

Satellite Sensor	SWIR nominal resolution	Refresh Rate	Geographic coverage	Automated detection algorithm
GEOSTATIONARY GOES-East GOES-West	4km	15 minutes	CONUS/Canada/ Central America	WFABBA
			Western half of CONUS/Alaska/ Hawaii	
POLAR NOAA-15/17/18 MODIS Terra MODIS Aqua	1km	Twice/day low/mid latitudes More frequent at high latitudes	Most of North/Central America except NOAA-15 which does not cover Western US	FIMMA MODIS

FIRMS – Fire Information for Resource Management System
http://earthdata.nasa.gov/data/nrt-data/firms

Global **MODIS** interactive fire maps
for any period during the MODIS mission

Burned area interactive map.
KML files for past 6 days

Archive available – generate shape and/or csv files

•*Email alerts for active fires.*

This is the only site covered in this presentation with global fire data.

MODIS Active Fire Mapping Program

Fire Information from MODIS Complied by USDA

http://activefiremaps.fs.fed.us/

EOSDIS
EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM

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About EOSDIS | Data | Our Community | User Resources | Labs | Wiki | Register

Discovering Data | Data Tools | Data Centers | Near Real-Time Data | Standards and References

Near Real-Time Data

Land Atmosphere Near Real-time Capability for EOS

Near Real-Time Data

- Data
- Visualization
- **FIRMS**
  - Web Fire Mapper
  - MODIS Global Fire Maps
  - Fire Email Alerts
  - Active Fire Data
  - About
  - Background
  - Publications
  - Links
- Rapid Response
- Learn
- About LANCE
- FAQ
- Support

GET DATA

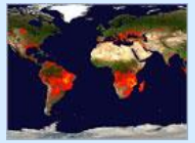
- MODIS
- AIRS
- MLS
- OMI
- Platform
- Hazards and Disasters

NRT HIGHLIGHTS

FIRMS
Download MODIS fire data

Home » Data » Near Real-Time Data

Fire Information for Resource Management System (FIRMS)



FIRMS delivers global MODIS hotspots / fire locations in easy to use formats.

Download active fire locations, subscribe to email alerts or view fire locations in in Web Fire Mapper. Monthly MODIS Burned Area (MCD45) images can be viewed in Web Fire Mapper. The active fire locations represent the center of a 1km pixel that is flagged by the MOD14/MYD14 Fire and Thermal Anomalies algorithm as containing one or more fires within the pixel.

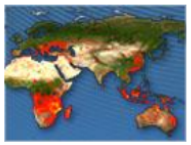
Subscribe to the LANCE FIRMS mailing list

Download Data
Download recent and historic global MODIS fire locations in user friendly formats.
Shape, KML, WMS or Text Files
Archive Download Tool

Email Alerts
Receive notification near real-time or as

Active Fire Data provides access to 24 hr, 48 hr and 7 day data in several formats.

Web Fire Mapper
Interactively browse daily global MODIS Fire locations and monthly burned areas through Web Fire Mapper.



Global Fire Maps
View and download global 10-day fire maps and monthly composite animations by year, summarizing the fire activity across the world.

MODIS Active Fire Mapping Program

Fire Information from MODIS Complied by USDA

http://activefiremaps.fs.fed.us/

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Land Atmosphere Near Real-time Capability for EOS

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FIRMS
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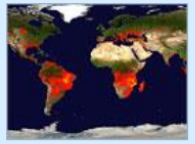
Fire Information for Resource Management System (FIRMS)



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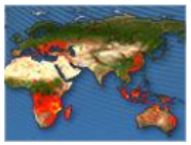
Download Data
Download recent and historic global MODIS fire locations in user friendly formats.
Shape, KML, WMS or Text Files
Archive Download Tool

Email Alerts
Receive notification of fires in your area-of-interest by subscribing to free FIRMS fire email alerts. Email alerts can be delivered in near real-time or as daily or weekly summaries.

Web Fire Ma
Interactively

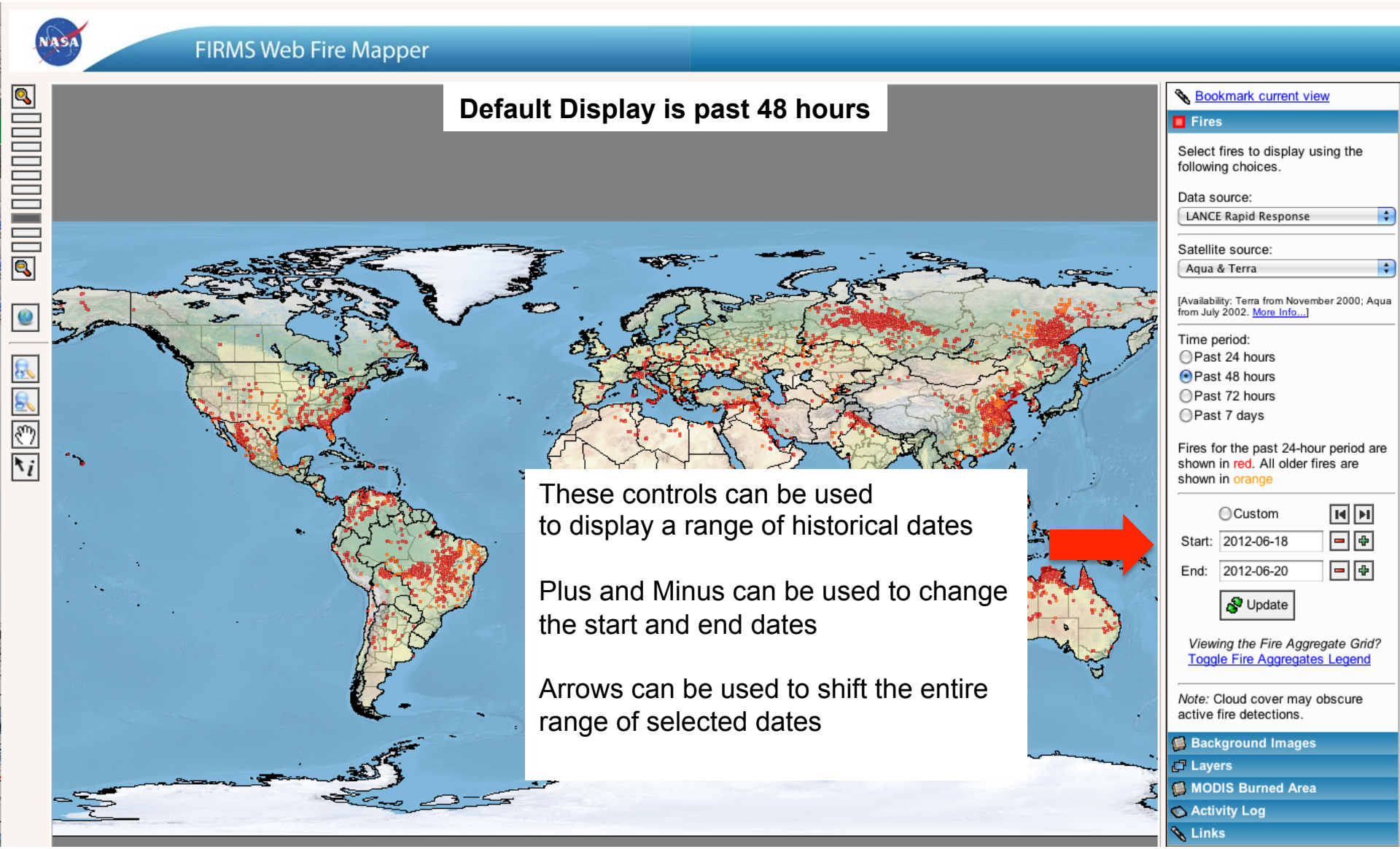


Global Fire
View and dov
world.

Email Alerts can be used to design a custom alert to inform you of fire events in your area of interest

Firms Web Fire Mapper
Uses Only MODIS Detections

https://earthdata.nasa.gov/data/near-real-time-data/firms/web-fire-mapper



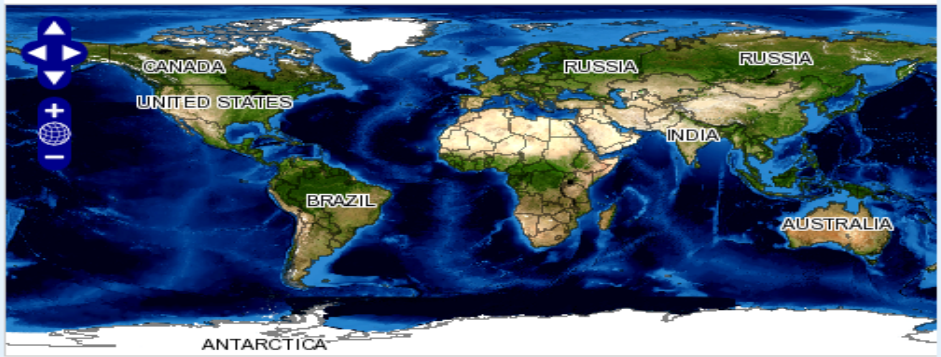
Archive Download Tool

Step 1: YOUR AREA-OF-INTEREST

a. Choose an Area on Map

Select on Map:

To zoom to your region of interest, hold the ***shift*** key and drag your mouse.
To draw a multi-sided polygon, use the "Draw Polygon" feature (below map).



Note: Protected areas are displayed as green polygons. Please zoom in to view protected areas.

Navigate Map Draw Polygon (Clear Polygon[s])

Create Rectangle using Coordinates:

Bottom-Left X: Y:

Top-Right X: Y: Zoom map Clear

-- OR --

b. Choose a Protected Area

Step 2: DOWNLOAD OPTIONS

From what date?

To what date?

Output Format Shapefile (.shp)

Please note: Data from Terra available from Nov. 2000; Aqua from July 2002.

Step 3: YOUR INFORMATION

Your Email

You can also create a custom request for data which will be processed for you as either a shape file or in csv format.

Forest Service Active Fire Mapping Program
http://activefiremaps.fs.fed.us/

Interactive Fire Detection Mapping for the past 24 hours.
U.S. and Canada

Historical KML files of fire detection and fire radiative power available beginning July 2008

Monthly burn scar data in KML format.

MODIS Active Fire Mapping Program

Fire Information from MODIS Complied by USDA

http://activefiremaps.fs.fed.us/

- Current Large Fires (Home)
- Fire Detection Maps
- Interactive Fire Detection Viewer
- Satellite Imagery
- Fire Detection GIS Data
- Fire Data in Google Earth
- Fire Data Web Services
- Latest Detected Fire Activity
- Burn Scar Data
- Other MODIS Products
- Frequently Asked Questions
- About Active Fire Maps

RSAC

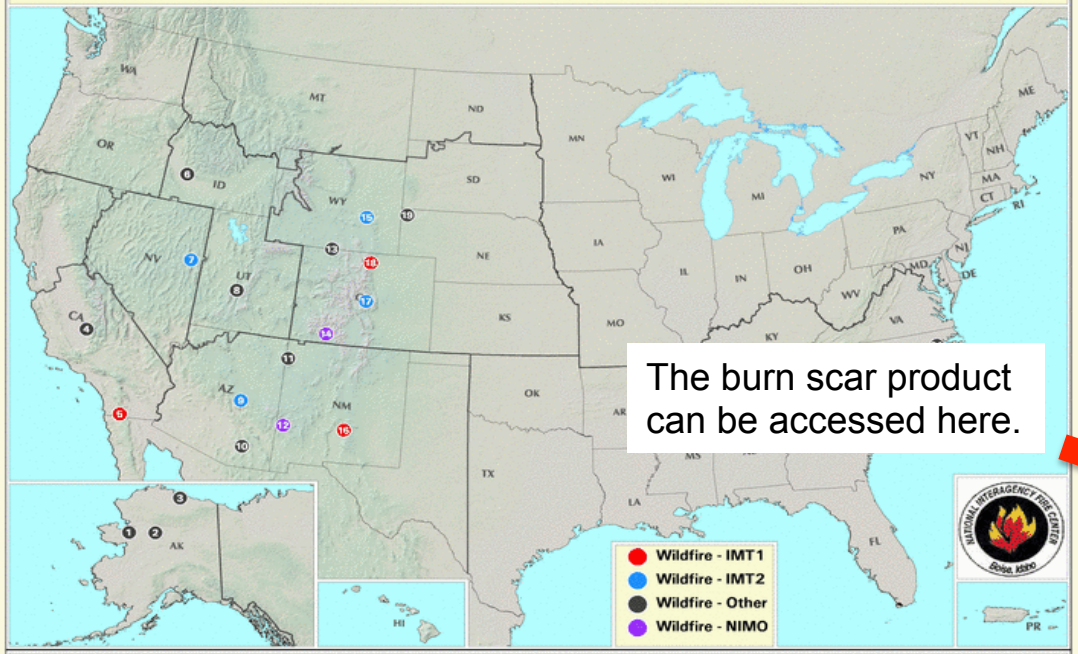
Remote Sensing Applications Center

2222 West 2300 South
Salt Lake City, UT
84119 - 2020

voice: (801) 975-3737
fax: (801) 975-3478

Large incident map is currently updated each Friday or as fire conditions warrant.
Current fire information may not be available due to IMSR updates occurring only on Friday.
Fire locations are based on data provided by the National Interagency Coordination Center and are subject to change.

Current Large Incidents
June 20, 2012



1 BUCKLAND RIVER
2 HOGATZA RIVER
3 ITKILLIK RIVER
4 GRAPEVINE
5 OLD 2
6 MM86 I84
7 NORTH SCHELL
8 GLENANNA
9 POCO
10 FOX
11 DENNEBITO WASH
12 WHITEWATER-BALDY
13 WILLOW
14 LITTLE SAND
15 RUSSELS CAMP
16 LITTLE BEAR
17 SPRINGER
18 HIGH PARK
19 COTTONWOOD
20 C.L.
21 DAD

View Printable Map | View High Resolution Map | Definition of Map Terms | Download KMZ File | Select a Fire | Go

Feedback | Disclaimers | Privacy Policy

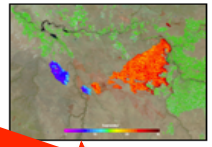
IMSR Summary
June 20th, 2012

National Preparedness Level

Level 3
National Fire Activity
Initial attack activity: Light (165 new fires)
New large fires: 8
Large fires contained: 2
Uncontained large fires: 16
Area Command Teams committed: 0
NIMOs committed: 2

Source:
Incident Management Situation Report

Active Fire Mapping News
August 22, 2011



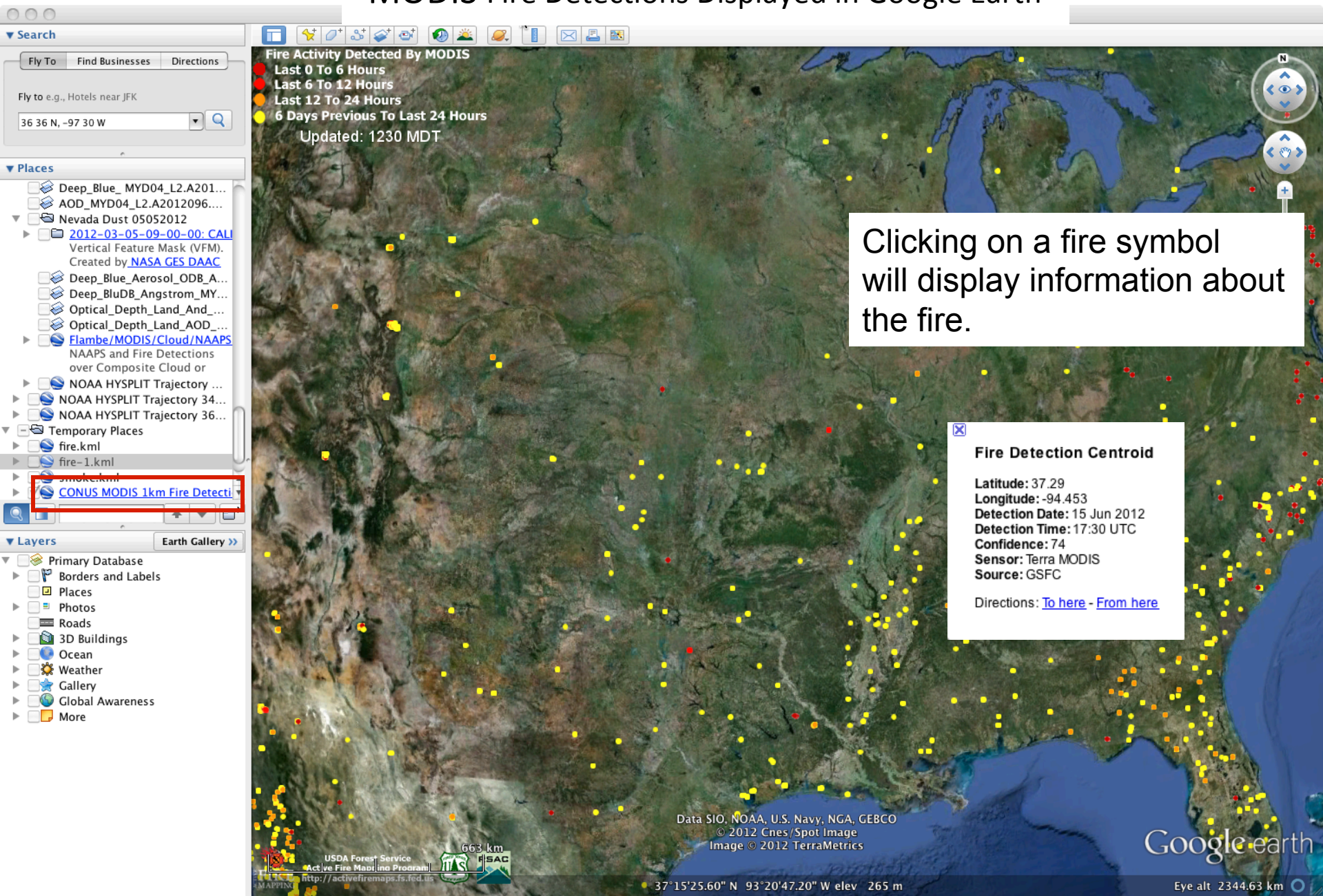
MODIS 500m dNBR readout burn scar product now available. Click here or the Burn Scar Data link on navigation menu to the left to access these data.

The burn scar product can be accessed here.

Select a fire from the drop down menu to get additional information.

USDA Active Fire Mapping Program

MODIS Fire Detections Displayed in Google Earth



Abba Fire Products
http://wfabba.ssec.wisc.edu

GOES fire imagery for *North and South America*

Geostationary loops for past 24 hours

Very complete Google Earth interface

Go to the "Realtime loops" link for more information and to find the loops

The GOES Wildfire Automated Biomass Burning Algorithm (WF_ABBA)

http://cimss.ssec.wisc.edu/goes/burn/abba.html

- Automatically locates and characterizes sub-pixel fires in GOES imagery in the **Western Hemisphere**

- The product is run every 30 minutes

Product includes:
- Fire Location (lat./lon.)
- Estimates of Fire Size and Temperature
- Ecosystem Type

WF_ABBA fire product available as:
- ASCII text files, AREA files
- Alpha-blended composite imagery

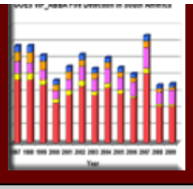
Binary Data: ftp://sate_psanone.nesdis.noaa.gov/FIRE/ABBA/

http://cimss.ssec.wisc.edu/goes/burn/wfabba.html

Page with links to fire imagery and Google Earth interface

WildFire Automated Biomass Burning Algorithm

Fire Data | About | Case Studies | Publications | Links



The Global Wildfire ABBA Fire Product

The experimental Wildfire Automated Biomass Burning Algorithm (WFABBA) is currently generating fire data across the globe. The WFABBA is an extension of the ABBA. The geostationary NOAA weather satellite GOES-13/-14 (GOES-East) provides coverage for North and South America, and GOES-15 (GOES-W) covers North America. The European satellite, Meteosat-9/-10, operated by EUMETSAT covers Europe and Africa. The Japanese MTSAT-1R/-2, operated by JMA and Korean COMS operated by KMA, covers Asia and Australia.

The WFABBA imagery can be generated using the fire mask product that at the assignes a mask code to every pixel. The resulting ilustration shows the extent of coverage, where fires are found, and possible reasons fires might not have been found (i.e. clouds, bad or missing data). Each image time can be navigated using tools to zoom and pan across areas of interest. Note that the fires are enlarged to enhance visibility. A daily animation of all image times is also available.

The results from the WFABBA are typically available within 90 minutes of the satellite scan time. The output can be viewed in different ways. Using an interactive composite interface showing fire activity from today and yesterday using Google Earth and Google Map interfaces.

Fires from the WFABBA are divided into six categories: processed fire, saturated fire pixel, cloudy fire pixel, high possibility fire pixel, medium possibility fire pixel, and low possibility fire pixel. Data noise, extremely hot surfaces, and sometimes cloud shadows can give false alarms for fires. The vast majority of processed fire pixels are not false alarms.

Links to Fire Mask Imagery

GOES-West	GOES-East	METEOSAT	COMS	MTSAT
02/10/14 GOES-15 animation 0145 0141 0130 0122 0115 0111 0100 0052 0030 0000	02/10/14 GOES-13 animation 0139 0132 0115 0109 0102 0045 0039 0015	02/10/14 MET-10 animation 0130 0115 0100 0045 0030 0015 0000	02/10/14 COMS animation 0115 0100 0030 0015 0000	02/10/14 MTSAT-2 animation 0101 0032 0014 0001
GOES-West	**GOES-East**	**METEOSAT**	**COMS**	**MTSAT**
02/09/14	02/09/14 GOES-13animation	02/09/14 MET-10 animation	02/09/14 COMS animation	02/09/14 MTSAT-2 animation 2332 2314 2301 2232

http://wfabba.ssec.wisc.edu

WildFire Automated Biomass Burning Algorithm

Fire Data | About | Case Studies | Publications | Links

News and Events

- Fire mask imagery
- Fire mask animations
- Google Earth visualization tool
- Past News and Events

Updated
5-Feb-2014

WF ABBA

WildFire Automated Biomass Burning Algorithm

The Wildfire Automated Biomass Burning Algorithm (WFABBA) processing system uses geostationary satellite data to detect and characterize biomass burning. WFABBA was developed at the Cooperative Institute for Meteorological Satellite Studies (CIMSS) within the Space Science and Engineering Center (SSEC) at University of Wisconsin (UW-Madison) as a collaborative effort between NOAA / NESDIS / STAR and UW-CIMSS personnel. The GOES WFABBA has been running in real-time since 2000 and operationally in NESDIS since 2002.

Popular Sites

- Fire Data
- CIMSS Satellite Blog
- Contact

Partners

- CIMSS
- SSEC
- UW-Madison

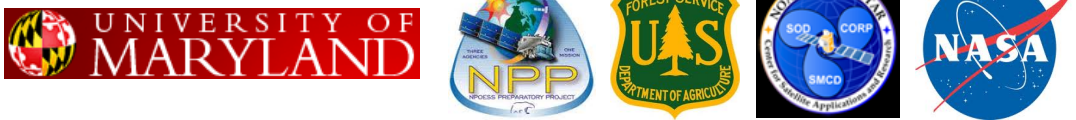
Fire Data | About | Case Studies | Publications | Links

Suomi-NPP VIIRS Active Fire:

Introduction to Remote Sensing for Air Quality Applications

NASA Applied Remote SEnsing Training (ARSET)

Evan Ellicott (UMD),
Ivan Csiszar (STAR/NESDIS), Krishna Vadrevu (UMD),
Wilfrid Schroeder (UMD), Louis Giglio (UMD),
Chris Justice (UMD), Brad Quayle (USDA Forest Service)
Peter Roohr (NWS/NOAA)

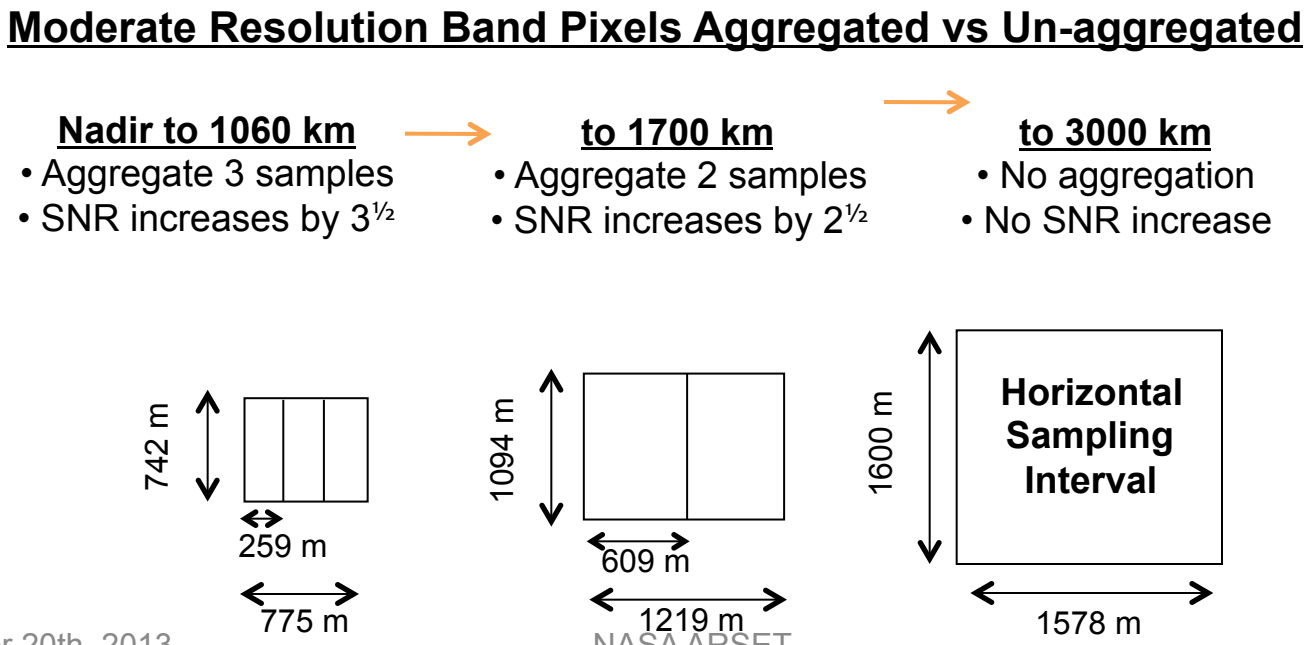


S-NPP VIIRS vs. Aqua-MODIS

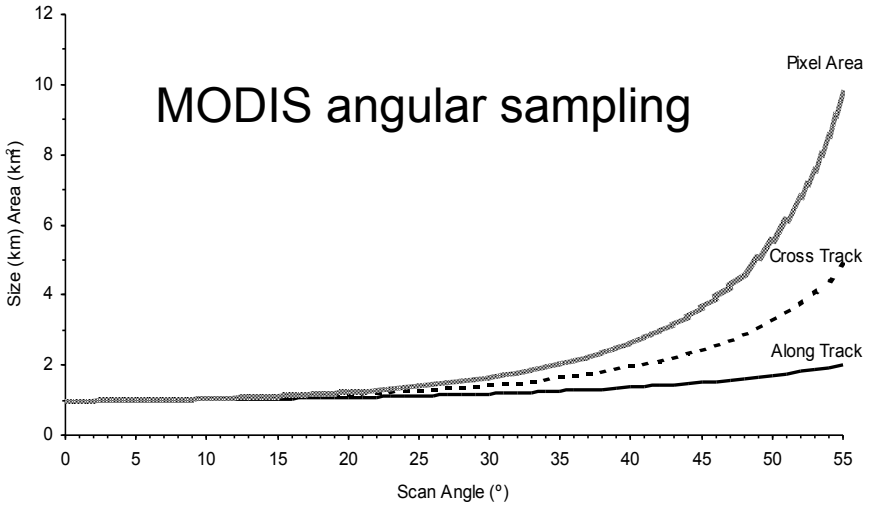
- Aqua and NPP have **similar overpass times (1:30pm)**
  - Sampling of the diurnal fire cycle is similar
- Saturation levels of the primary bands allow **unsaturated radiance measurements** for most fires
  - Bands 21/22 for MODIS and M13 for VIIRS
- Processing **algorithms are compatible**
  - Current VIIRS algorithm is based on MODIS (C4)
  - Differences can be resolved and the impact can be minimized
- Primary driver of differences is **spatial sampling**
  - Pixel size
  - Variations along scanline (aggregation schemes)
  - Variations within pixels (line-spread function, aggregation)
  - Differences in swath width (VIIRS has no gaps at low latitudes)

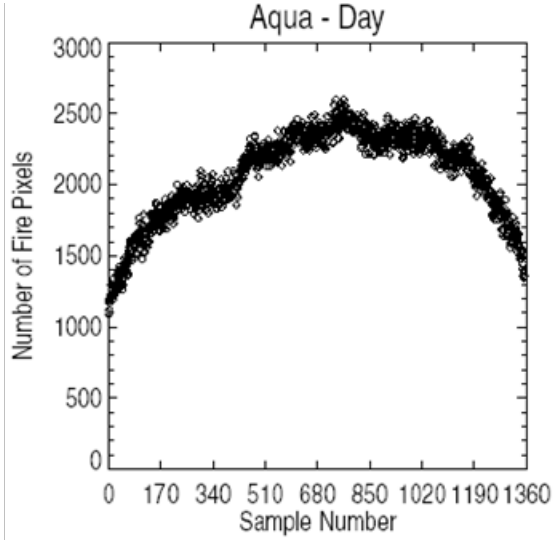
VIIRS aggregation

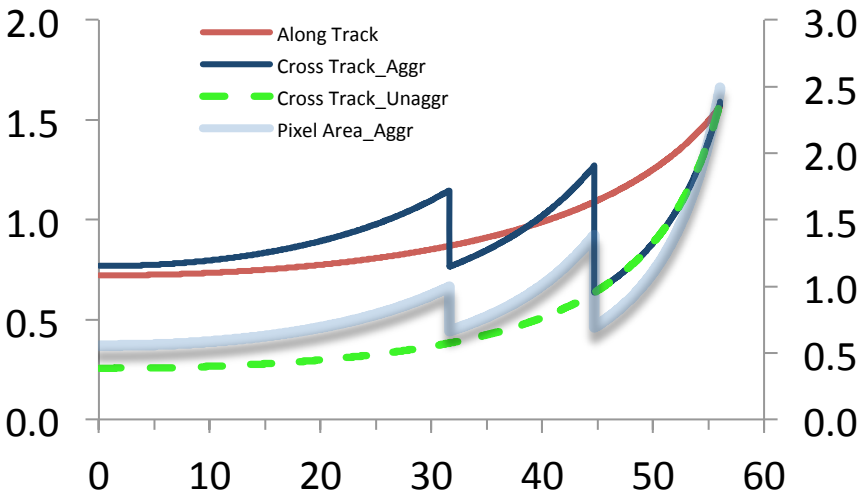
- Normally VIIRS passes M13 un-aggregated and M15 aggregated
- Un-aggregated pixels are smaller in scan than aggregated pixels (which are more uniform in shape along the scan) by the aggregation factor

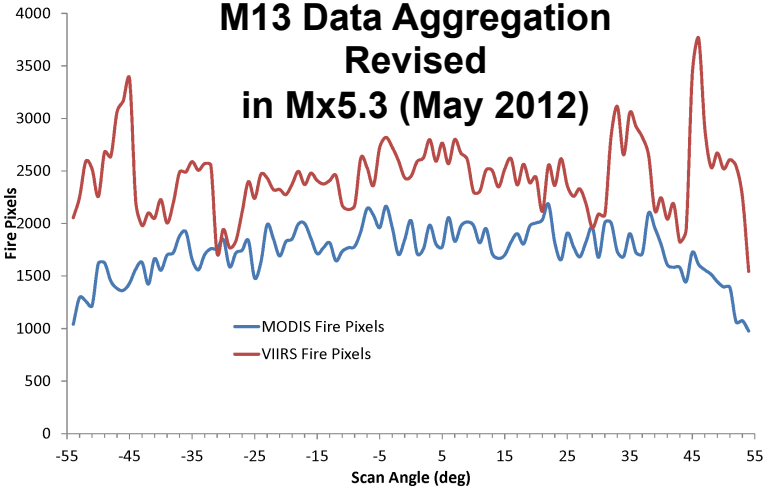


M13 aggregation anomaly





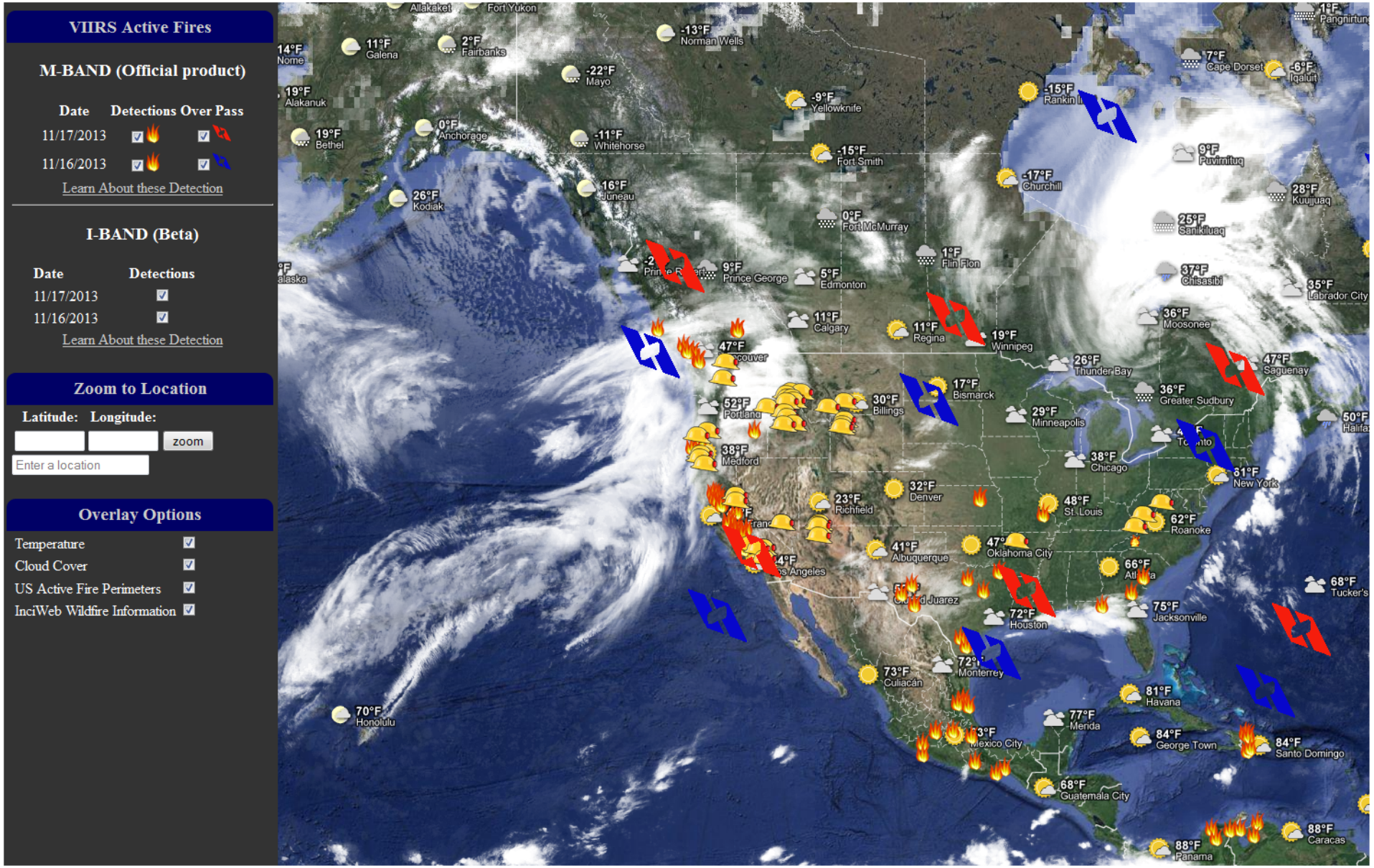




VIIRSxMYD14 Fire Detection Frequency (**11 May <> 10 Jun**)

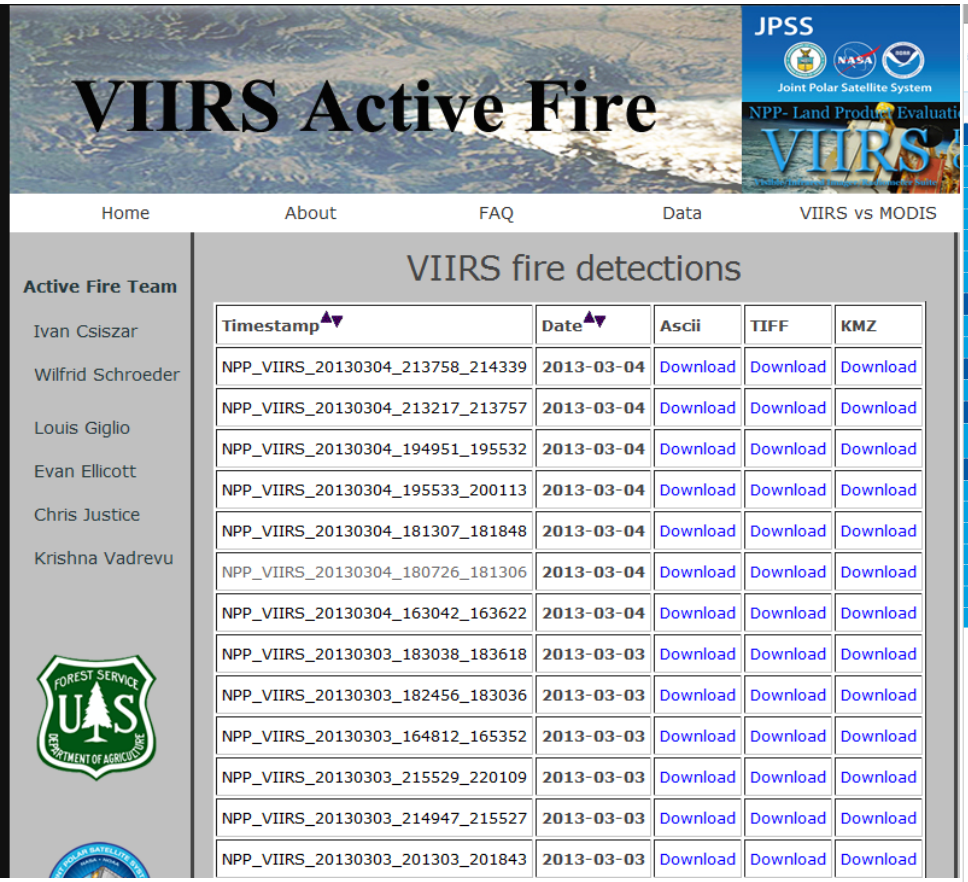
VIIRS AF website

Screen shot of the data delivery interface on the VIIRS Active Fire website


VIIRS Active Fires
M-BAND (Official product)
Date
Detections
Over Pass
11/17/2013
11/16/2013
Learn About these Detection
I-BAND (Beta)
Date
Detections
11/17/2013
11/16/2013
Learn About these Detection
Zoom to Location
Latitude:
Longitude:
zoom
Enter a location
Overlay Options
Temperature
Cloud Cover
US Active Fire Perimeters
InciWeb Wildfire Information
Allakaket
Fort Yukon
14°F Nome
11°F Galena
2°F Fairbanks
-13°F Norman Wells
-22°F Mayo
19°F Alakanuk
-9°F Yellowknife
19°F Bethel
0°F Anchorage
-11°F Whitehorse
-15°F Fort Smith
16°F Juneau
26°F Kodiak
0°F Fort McMurray
9°F Prince George
5°F Edmonton
1°F Flin Flon
11°F Calgary
11°F Regina
19°F Winnipeg
47°F
52°F Portland
30°F Billings
17°F Bismarck
38°F Medford
29°F Minneapolis
38°F Chicago
32°F Denver
23°F Richfield
48°F St. Louis
62°F Roanoke
41°F Albuquerque
47°F Oklahoma City
66°F
72°F Houston
75°F Jacksonville
73°F Culiacán
72°F Monterrey
70°F Honolulu
81°F Havana
77°F Merida
84°F George Town
84°F Santo Domingo
68°F Guatemala City
88°F Caracas
88°F Panama
-15°F Rankin I
-6°F Iqaluit
7°F Cape Dorset
9°F Puvirnituq
-17°F Churchill
28°F Kuujjuaq
25°F Sanikiluaq
37°F Chisasibi
35°F Labrador City
36°F Moosonee
26°F Thunder Bay
47°F Saguenay
36°F Greater Sudbury
50°F
61°F New York
68°F Tucker's
1°F Pangnirtung

Data Availability

http://viirsfire.geog.umd.edu/Documents/VIIRS_data_tutorial.pdf



Timestamp	Date	Ascii	TIFF	KMZ
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NPP_VIIRS_20130304_195533_200113	2013-03-04	Download	Download	Download
NPP_VIIRS_20130304_181307_181848	2013-03-04	Download	Download	Download
NPP_VIIRS_20130304_180726_181306	2013-03-04	Download	Download	Download
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NPP_VIIRS_20130303_164812_165352	2013-03-03	Download	Download	Download
NPP_VIIRS_20130303_215529_220109	2013-03-03	Download	Download	Download
NPP_VIIRS_20130303_214947_215527	2013-03-03	Download	Download	Download
NPP_VIIRS_20130303_201303_201843	2013-03-03	Download	Download	Download

Whitewater-Baldy Complex